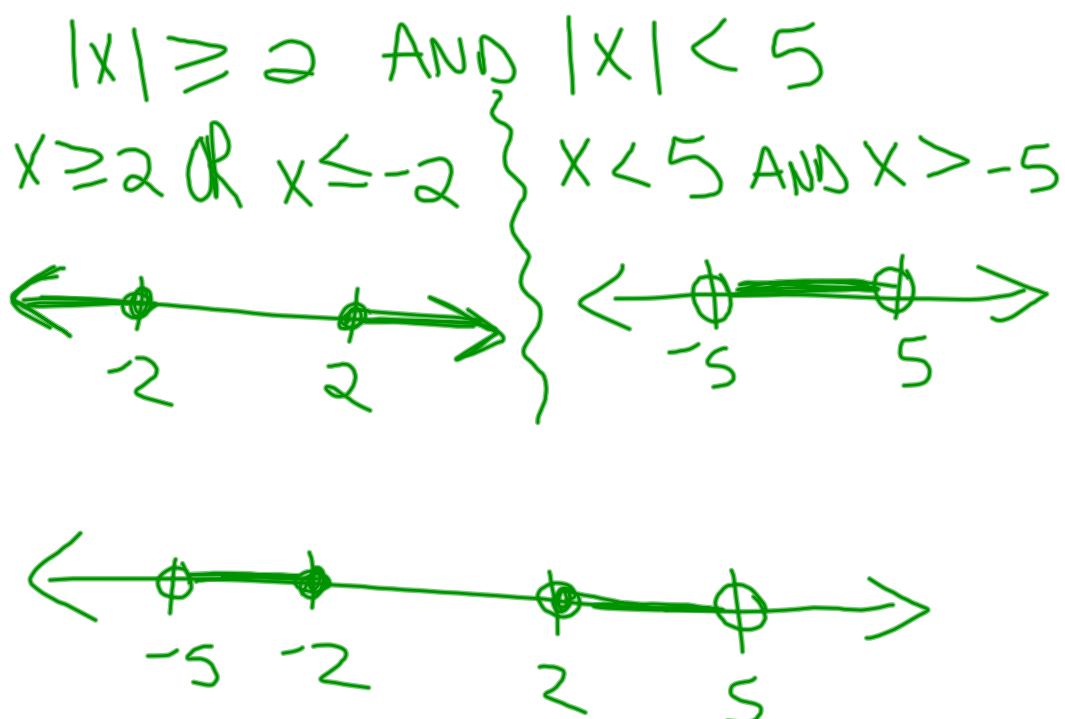


# Compound Absolute values and Double Absolute Value Inequalities

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Just Watch!

$$2 \leq |x| < 5$$



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example:

$$1 \leq |x-3| \leq 4$$

$$|x-3| \geq 1 \text{ AND } |x-3| \leq 4$$



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## Double Absolute Value

$$\text{ex: } |3x+2| < |x-2|$$

$$3x+2 < |x-2| \text{ AND } 3x+2 > -|x-2|$$

$$|x-2| > 3x+2$$

$$x-2 > 3x+2 \text{ OR } x-2 < -3x-2$$

$$-4 > 2x$$

$$-2 > x$$

$$4x < 0$$

$$x < 0$$



$$-3x-2 < |x-2|$$

$$|x-2| > -3x-2$$

$$x-2 > -3x-2 \text{ OR } x-2 < 3x+2$$

$$x > 0$$

$$x > -2$$



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ex:  $|2x + 1| < |x - 5|$

$$\begin{array}{l}
 2x + 1 < |x - 5| \text{ AND } 2x + 1 > -|x - 5| \\
 |x - 5| > 2x + 1 \quad \left\{ \begin{array}{l} -2x - 1 < |x - 5| \\ |x - 5| > -2x - 1 \end{array} \right. \\
 \text{OR} \\
 x < -6 \quad x < \frac{4}{3} \quad \left\{ \begin{array}{l} x > \frac{4}{3} \text{ OR } x > -6 \end{array} \right.
 \end{array}$$



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